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ABSTRACT

This digest answers the following questions that beginning or novice users may have about CD-ROM (a compact disk with read-only memory) database services: (1) What is CD-ROM? (2) What databases are available? (3) Is CD-ROM difficult to use? (4) How much does CD-ROM cost? and (5) What is the future of CD-ROM? (15 references) (MES)

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THE NOVICE USER AND CD-ROM DATABASE SERVICES

CD-ROM is a new storage medium that can serve as a quick, economical source of information for students, researchers, writers, and professionals in many fields. This digest will address some commonly asked questions that beginning or novice users may have about CD-ROM database services.

What is CD-ROM?

CD-ROM is a form of optical disk or laserdisk technology that is similar to the popular digital audio compact disk, or CD. As their name implies, CDs are written to and read by the concentrated light beam of a laser. The laser creates tiny pits, representing bits of digitized information, on the plastic surface of the disk. An optical disk can contain information in any form, including audio, video, text, graphics, or a combination. Unlike magnetic media (audio and videotapes, floppy and hard computer disks), optical disks are almost error-free and indestructible.

CD-ROM is a compact disk with read-only memory: information stored on it cannot be changed. The most conspicuous advantage of CD-ROM is its large storage capacity. One disk with 550 megabyte capacity can store 220,000 pages of text, or the equivalent of about 1,500 floppy disks. Used with a microcomputer, CD-ROM greatly expands the microcomputer's ability to deliver information in an interactive environment. CD-ROM databases can be accessed directly by users, thus freeing them from the necessity of consulting (and paying) an expert to do online mainframe searches. Information from many CD-ROM databases can be downloaded to floppy disk for later use with a word processor or other software, or printed on paper.

CD-ROM does have several disadvantages. Its greatest drawback is that information cannot be added or erased by the user. And CD-ROM still does not have the storage capacity to handle full-text documents in very large databases: many are indexes containing citations with abstracts. A number of databases are updated monthly or quarterly, but for current information such as news, this may not be sufficient. And while CD-ROM is capable of storing mixed media, most publishers offer text because text requires the least storage space. Full-motion video is not yet economical. Finally, the hardware does not allow a full range of flexibility and compatibility for those who wish to use more than one CD-ROM product.

What databases are available?

CD-ROM versions of nearly all popular reference sources are showing up in libraries, schools, colleges, and professional institutions. One of the earliest (1985) and most popular products is Grolier's *Electronic Encyclopedia*, which packs the entire text of the 20-volume *The Academic American Encyclopedia* onto one CD-ROM. An impressive resource for writers is *Microsoft Bookshelf*, which contains 10 classic reference books on one CD-ROM. These include a dictionary, thesaurus, spellchecker, almanac, *Bartlett's Familiar Quotations*, the *Chicago Manual of Style*, and a zip-code directory. Other CD-ROM products include *InfoTrac II* (Information Access Company), with listings from *The New York Times Index* and many other newspapers and magazines, and the *Readers' Guide to Periodical Literature* (H. W. Wilson). Two visual resources are *Facts on File Visual Dictionary* (Facts on File) and *On the World* (GEOVISION). *On the World* contains maps and lets the user create graphics, symbol overlays, and text. Substantial portions of enormous reference and research databases for business, law, medical and life sciences, social sciences, and engineering and hard sciences are available on CD-ROM, sometimes from more than one publisher.

Is CD-ROM difficult to use?

Most novices find CD-ROM easy and fun to use. *Microsoft Bookshelf*, for example, operates like a desktop utility. The writer uses just a few keystrokes to display a menu of reference books across the top of the screen, open a "window" for the desired resource, find the information (such as a zip code) and, if desired, download the information directly into the text he or she is writing.

Using many CD-ROM databases, however, requires learning some basic computer searching skills. Fortunately, most CD-ROM search software allows users to develop these skills naturally as they access information. Help is available through help screens and printed manuals. Many publishers also offer onscreen or print tutorials and toll-free assistance numbers.

Usually the search proceeds through a series of menus, beginning with choices of search fields, such as author, title, or subject. Users type in keywords and the system tells them how many items in the database contain those words. They call up and read the items and, again using menus, decide whether to print the information they want or download (save) it on a floppy or hard disk for later editing with a word processor. As users become more accustomed to searching, they can begin to use more sophisticated functions. For instance, they can use partial words as search terms (truncation), impose conditions such as "and," "or," or "not" (Boolean operators) between search terms, or combine different search fields in a single query. The software also offers different ways to browse through the indexes or the database itself. The new Grolier's illustrated encyclopedia, for example, has a hypertext feature that allows the user who is curious about a highlighted term in the text to access a definition or cross-reference instantly.

Novice users who are already familiar with computers and with library searching will find it easier to learn to search a CD-ROM. The tendency is usually to retrieve too much information: users must be able first to state their requests in specific terms, then to manage and synthesize the information they obtain. Institutions that have installed CD-ROM systems have found that another tendency is to rely too much on the CD-ROM database and forget that (1) other, traditional, reference sources are available, and (2) the library may not have all the materials described in an index database. Finally, one drawback

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of searching CD-ROMs is that not all search programs are created equal: users who access more than one database may need to adjust their search strategies for different software.

How much does CD-ROM cost?

A CD-ROM system can easily cost thousands of dollars. Disks run from a low end of about $200, to $2,000 or more for specialized research databases. Databases that are available on a subscription basis include regular updates and require the payment of an annual licensing fee. Minimum hardware requirements are a microcomputer and a CD-ROM drive. An interface card placed inside the computer connects it with the CD-ROM drive. Many systems call for IBM or compatible microcomputers with hard drives and a least 512K capacity, and most users also want color monitors and printers. Some research is necessary: not all CD-ROM drives read all CD-ROMs, and none read audio CDs. CD-ROM drives are sold at typical computer, electronics, and department stores. Package deals, including equipment leases and upgrade kits, are available. Microsoft, for example, is working on an agreement with Sears to sell its *Bookshelf* product with a CD-ROM drive for about $1,100.

While these costs may be discouraging for the individual, there is a bright side. Libraries and schools, which tend to find CD-ROM more convenient and less expensive than online searching and printed materials, are offering CD-ROM services for little or no charge. They also offer personal assistance in the form of librarians or instructors. This allows the novice user to become familiar with the technology before making a purchase. In the meantime, new products are being developed, existing products improved, and prices coming down in this highly competitive market.

What is the future of CD-ROM?

As enthusiastic as users have been toward CD-ROM and other optical disk technologies, the most exciting news is yet to come. Designers are currently developing media that can be written to and erased, including WORM (write once-read many) and DRAW (direct read after write). They are also exploring ways to increase the capacity of compact disks further, which would allow storage of more full-text databases such as newspapers. New chips compress audio and video data, thus making it more feasible to combine graphics and text for user-generated documents, desktop publishing, and presentation graphics, and to offer more full-motion video. Greater storage space increases the potential for more powerful software, including highly interactive programs, natural language interfaces, and artificial intelligence. Research efforts also include CD-I (compact disk interactive) and DVI (digital video interactive).

Databases are only the beginning. Optical disk applications include education and training at all levels from kindergarten to corporate. With enhanced interactivity and creative combinations of text, audio, and video, education in general will become more like entertainment. Children, for instance, will teach themselves reading and math skills while playing "games" with joysticks. Other products include intelligent games and simulations, drawing and painting, filming and animation, musical composition, and of course much improved capabilities for document writing and data analysis.

Inconveniences of current CD-ROM systems are being addressed. "Jukeboxes" now allow users to access many disks without manually changing them, and "daisy chains" allow several drives to be linked together. Hardware in general will become more standardized, less expensive, and more transportable. Multipurpose CD players will be able to stand alone without microcomputers. Portable units in cars, for instance, will provide maps and tourist information, mechanical diagnostics, and music.

While optical disk technologies are still very young—audio CDs were introduced in 1982 and CD-ROMs in 1984—their potential is revolutionary. New products are being marketed so fast that almost the only way to keep up is to read articles and advertisements in periodicals such as *Byte Magazine*, *CD-ROM Review*, *Database*, *Electronic and Optical Publishing Review*, *Optical Information Systems*, and *PC World*. Product reviews and publisher directories also appear in professional journals for educators, library and information specialists, and researchers in areas including management, law, economics, medicine, and agriculture.

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